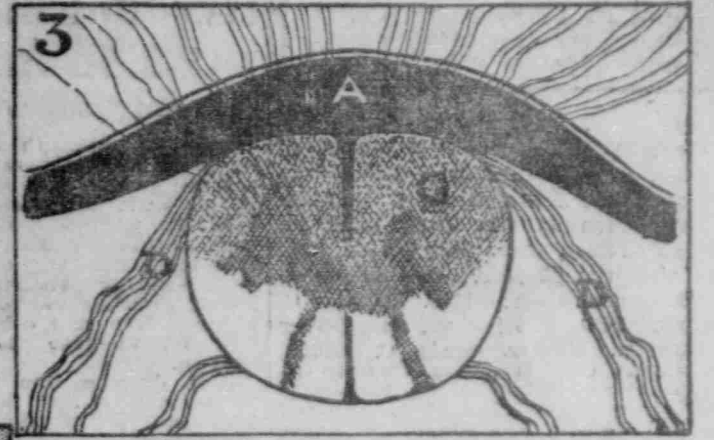
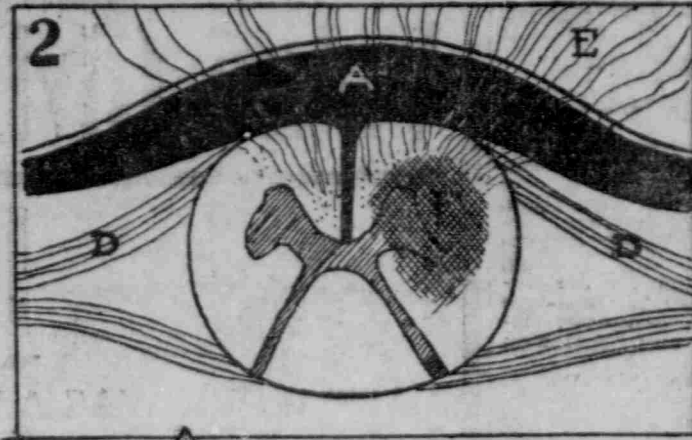


HOW THE PARALYSIS IS CAUSED.

1. Cross-section of the Normal Spinal Cord. A. Cauda; B. Between Cord and Covering; C. Sensory Cells; D. Motor Cells; E. Spinal Nerves Having Roots in Cord.

2. Beginning of Infection. E. Poison or Germs Filtering Through Spaces and Infusing Anterior Part of Cord; F. With Blood; G. the Nerve.

3. The Work Finished. G. Anterior Portion of the Cord Filled with Blood, Sensory and Motor Cells Disorganized and Broken; H. the Shrunken, Dying Nerve.



The Battle Against Infant Paralysis - Germ or Poison?

Newest Discoveries About the Cruellest, Most Insidious and Mysterious Scourge, Which Turns, Over Night, a Healthy Baby into a Helpless Cripple.

An Infantile Paralysis Sufferer Strengthening Withered Arms and Shoulders Upon an Apparatus Invented by Professor Mikulicz, of Berlin. This Method Has Produced Great Improvement in Patients.

THE enormously increasing cases of infantile paralysis—that insidious, most mysterious of diseases, which in a night turns a healthy baby into a helpless cripple—has set every great medical institution in the United States and Europe to work in the desperate effort to determine the cause of the scourge and its remedy. Upsetting certain theories held by the medical world this season, the horrifying spread of the malady has stimulated the search, even though

the fact that of the hundreds of thousands of cases 96 per cent are crippled for life, 3 per cent recover and 1 per cent die, were not enough. For one thing, it had been confidently held that infantile paralysis was caused by a germ. In another, that it persisted only during hot weather, and the cool weather showed a minimum of cases. The cold weather killed it.

This year saw a comparatively mild summer, and particularly so in the communities which show the greatest increase of the disease. In Middletown and other Connecticut cities anterior poliomyelitis, as the disease is

technically called, appeared in epidemic form. Schools have been closed in the hope of stopping the spread of the disease, and the same course has been pursued in Washington, D. C., and in other cities, but without very much success. It has also been found that breast-fed babies are less liable to be attacked as are bottle-fed babies, and that no amount of caution in the matter of food or surroundings prevents the infection.

The New York state board of health has added it to the list of diseases that must be quarantined and reported by physicians.

Should an epidemic develop, the health department has declared its intentions of closing the schools, and the half million school children will be kept at home until conditions improve.

Further, it has been discovered that in many cases there has been no knowledge on the part of parents and physicians as to the true meaning of the disease, in some cases, slight spasms and nausea, which accompany the disease, and the fact that the child has had infantile paralysis is not known until, perhaps, for days, when an arm or leg begins slowly to weaken, or some other muscular deformity develops, and it is also known to medical science that much of what is simply diagnosed as curvature of the spine, abdominal lesions, joint disease and other deforming diseases have had their origin in an unnoticed or unrecognized attack of the paralysis.

And further the scourge does not confine itself to babies, but attacks children even 6 to 10 years old. It would not seem to the layman, perhaps, that the overturning of the well-grounded theory that the disease is caused by a germ is a hopeful one.

Yet medical science considers that progress even to this point is great advance where such a mysterious disease is concerned.

That it is infectious has been proven to the satisfaction of physicians of the Rockefeller Institute for Medical Research, which has led in the battle upon the disease. Experiments under the direction of Drs. Simon Flexner and Paul A. Lewis upon monkeys have shown them this. Dr. Flexner concludes that the disease must be included among the well-defined infectious maladies, and that it is caused by a minute organism or germ, which is so small that it cannot be detected by the strongest microscope and readily passes through a Berkefeld filter, a contrivance which successfully isolates all other well-known bacteria.

On the other hand, surgeons such as Dr. H. W. Frauenthal, head of the hospital for deformities and joint diseases in New York, are inclined to the belief that the disease is due to a very virulent and active poison generated in the intestinal canal.

Whether a poison or a germ, the latest researches have shown that the agent operates entirely on the spinal cord, the cellular nerve structure of which it destroys. It affects only the anterior or forepart of the cord. When its work is done, the nerves surrounding the affected portion are in the same plight as the roots of a tree, the soil around which has been poisoned or polluted. The nerves wither, starve and finally die. The muscular portion of the body which they have controlled, deprived of their force and feeding directions, finally withers also. Hence come distorted backs, shrunken arms and legs and twisted faces.

The hospital of which Dr. Frauenthal is the head treats thousands of cases of infantile paralysis a year. By

tion of the disease or of its treatment while the paroxysm is on is concerned, success is as far away as ever it was. But the happy part is that the effects of paralysis can be cured. To say that they can be cured in all cases would be going too far, but in the war against such a devastating, horrible, mysterious disease as this, the fact

that the part of the spinal cord affected can be relieved of its blood infiltration, that the cells can be restored and with them the withered nerves and withered limbs, is warrant that some time medical science will be able to wipe out all the effects of this new scourge even if it is not able to prevent the plague from striking.

Dr. Frauenthal, from his most recent researches, cannot tell whether a poison or a germ is responsible. But he believes that the poison or a germ is generated in the intestinal canal. It then, most probably, is carried by the nerves of the sympathetic system, whose great brain is the solar plexus, to the spinal cord.

In its passage to the front or anterior part it causes infiltration of blood in the vertebra. Locating in the front of the cord it breaks down the ganglionic cells, of which the gray matter of the cord is composed, and a "mash" of broken cells and blood gathers. Paralysis of limbs, face and other portions of the body controlled or in sympathy with the nerves emanating from the affected parts follows. If the breaking down is very great, death ensues.

The Rockefeller Institute surgeons are still convinced that a minute germ is responsible for the disease. But they admit that although various bacteria have from time to time been isolated in cultures from the fluid obtained by puncturing the lumbar section of the spinal column of patients suffering from the disease, or from specimens of the central nervous system removed at autopsy, these germs did not conform to any one species of micro-organisms and were unable to reproduce the disease in animals. Dr. Flexner believes they are to be regarded more as secondarily invading bacteria than as the cause of the disease itself.

The bacteria cannot be found in the blood of children suffering from the disease, nor from one who has died from it. But about a year ago the institute secured the spinal cord from two cases of fatal paralysis in children, and elaborate experiments have since been conducted upon animals. As a result, Dr. Flexner concludes that the virus epidemic poliomyelitis obtained from the spinal cord when introduced into the body by means of either the brain, the blood, subcutis, peritoneum, spinal canal or large nerves, tends to localize in the spinal cord and brain and produce typical infantile paralysis.

Experiments made to produce infection by feeding the virus to monkeys were unsuccessful. It was also determined that not only the spinal cord itself, but the fluid contained in the spinal column of a person suffering from the disease is capable of setting up the disease in animals. The blood of infants suffering from the disease injected into monkeys uniformly failed to produce paralysis.

Dr. Flexner found that the abnormal conditions in the spine and medulla oblongata were visible to the naked eye and consist of congestion and hemorrhage of blood in the gray matter chiefly, although the white matter was also similarly affected to a certain degree. The severest lesions occur at the points in the spinal cord corresponding to the most marked paralysis of muscle groups.

Another interesting conclusion arrived at from these experiments by the surgeons at the Rockefeller Institute is that immunity is afforded by an attack of the disease, and no patient can have it twice.

It is a curious fact that although scientists succeeded in producing the disease in eighty-one monkeys that were inoculated with the spinal virus, they were unable to produce similar results with other animals.

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